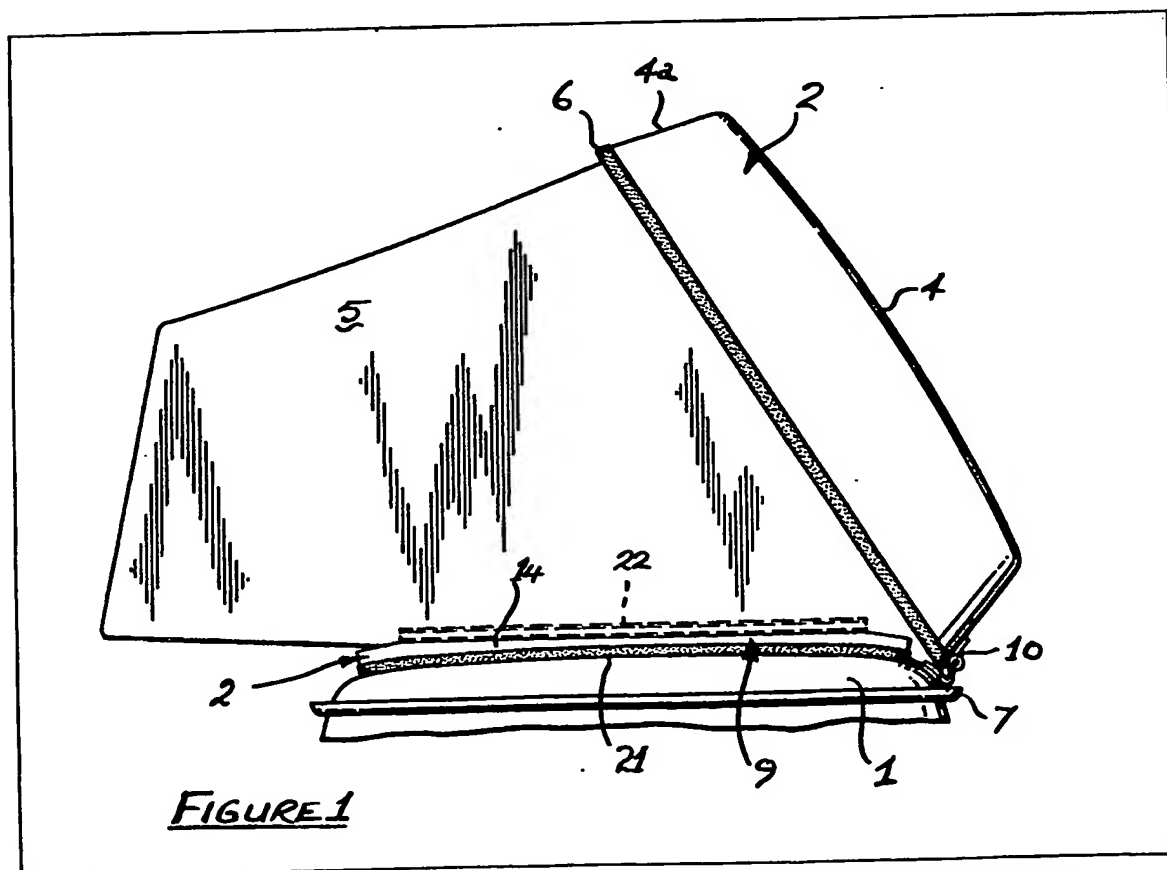


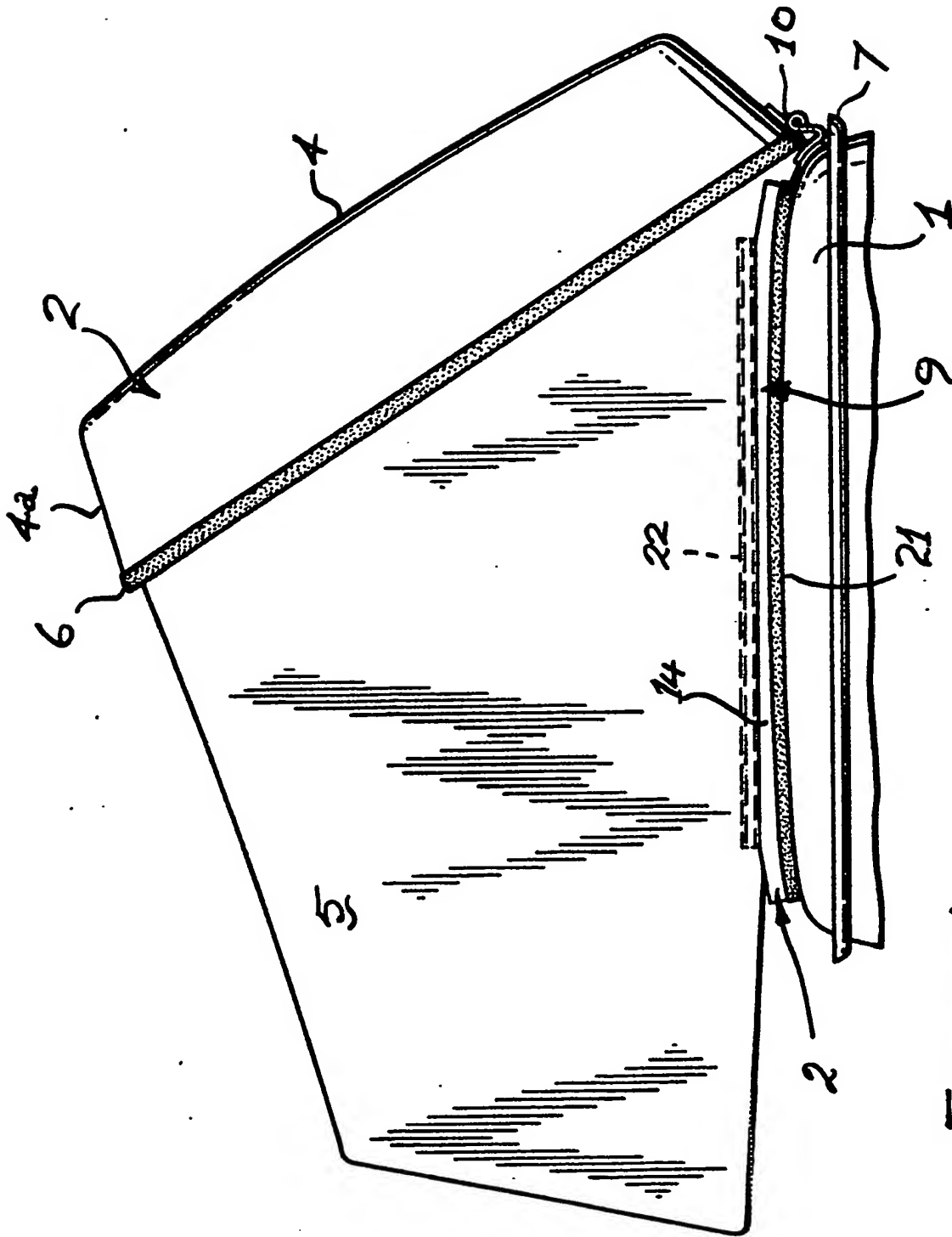
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(54) Elevating roof for motor vehicles

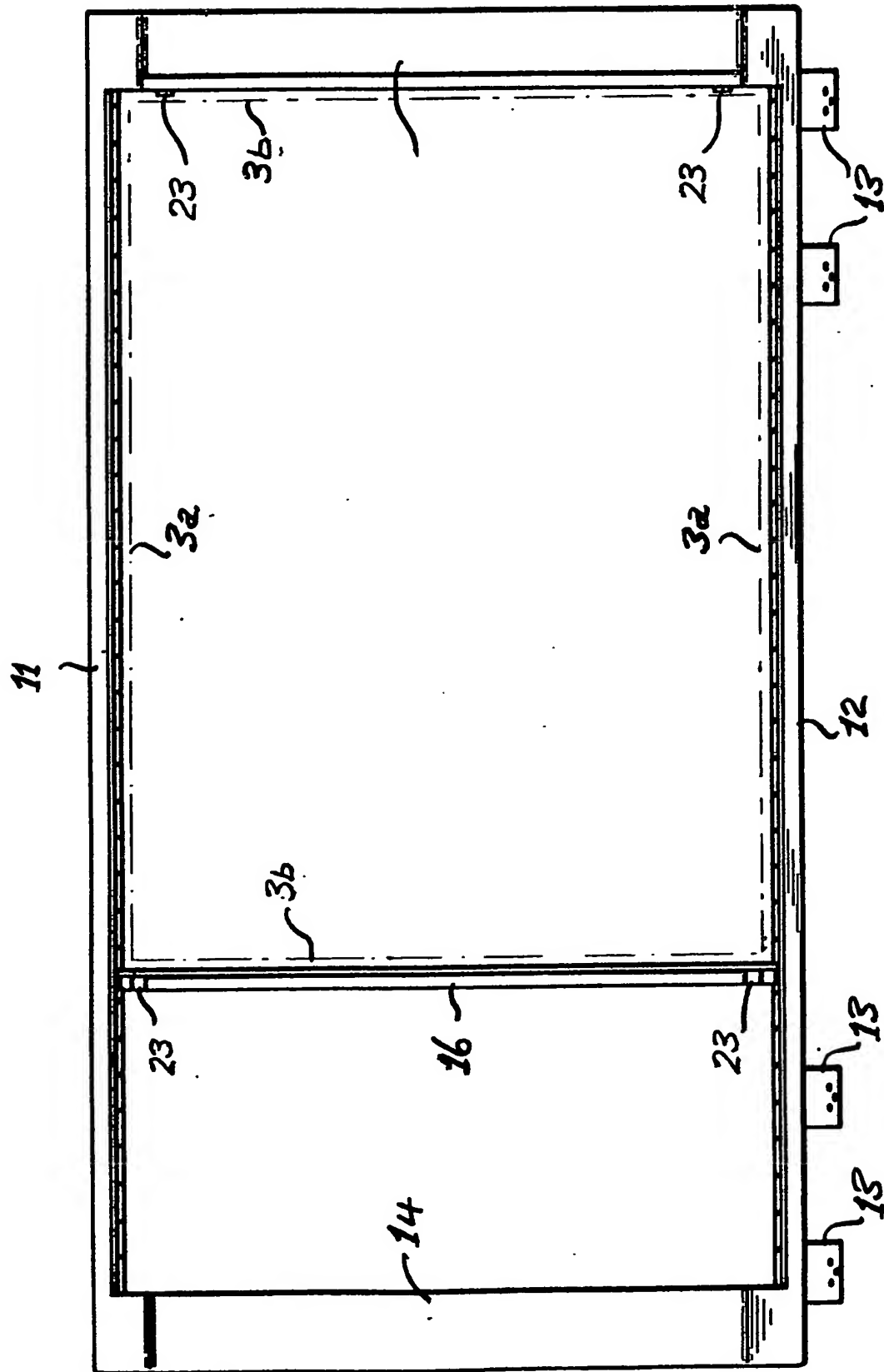
(57) The object of the invention is to provide a construction for the elevating arrangements claimed in Patent Specification Nos. 1485975 and 1565322 which enables the elevating roof components to be pre-assembled. This is achieved by mounting the elevating roof components (including rigid member 4 and canopy 5) on a rectangular base frame 9 instead of directly on the vehicle roof. The base frame 9 and the elevating roof can then be located and fixed as a unit over the aperture in the vehicle roof.



The drawing(s) originally filed was/were informal and the print here reproduced is taken from a later filed formal copy.



**FIGURE 1**

FIGURE 2

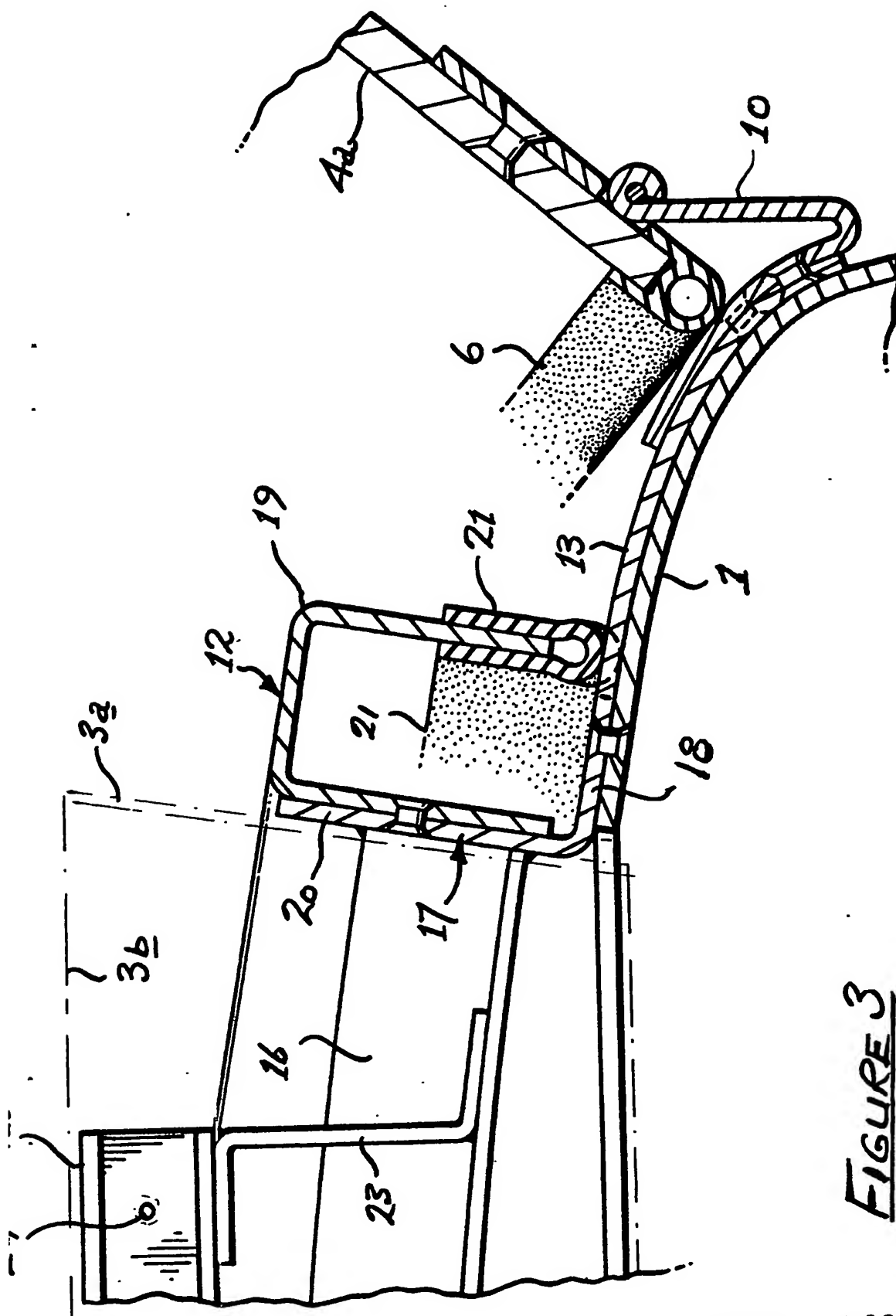


FIGURE 3

## SPECIFICATION

## Elevating roof for motor vehicles

5 This invention relates to elevating roof arrangements for attachment to cars, vans, estate cars or other vehicles to provide additional headroom as required, and is an improvement in the elevating roof arrangement described and claimed in Patent Specification No. 1485975 and its Patent of Addition Specification No. 1565322, the rights of which have now been assigned to us.

In Patent Specification No. 1485975 there is provided, for use in conjunction with a vehicle having a roof in which is provided a substantially rectangular opening which has a pair of longitudinal edges and a pair of transverse edges, an elevating roof arrangement comprising in combination a rigid substantially rectangular member which is adapted to be hinged along one edge thereof to said roof, parallel to said longitudinal edges, for movement between a lowered position covering said opening and a raised position where it provides one wall of said roof arrangement, a canopy of foldable material to extend between corresponding edges of said rigid member and the roof of said vehicle, which canopy, in use, is unfolded in said raised position of said rigid member to provide the other walls of said roof arrangement, and framework means comprising first and second generally U-shaped members, said first U-shaped member being provided with abutments on its limbs and being supported in a plane above and substantially parallel to the plane of said opening with its free ends mounted in guides or cylinders located respectively adjacent said transverse edges of said opening, and said second U-shaped member having ends associated with the limbs of said first U-shaped member for engagement by said abutments, the bridges of both U-shaped members being attached to said foldable material at spaced positions on a wall portion thereof opposite to said rigid member, whereby said roof arrangement can be elevated by a sequence of steps comprising: raising said rigid member and thereby also moving said second U-shaped member to a partially raised position, and thereafter moving said ends of said second U-shaped member outwardly to engage against said abutments provided on said first U-shaped member whereby continued said outward movement urges both of said U-shaped members to their respective limit positions whereat they support said opposite wall portion in a position outwardly beyond that longitudinal said edge of said opening which is opposite to said hinge, such that a region of said canopy associated with said wall portion overhangingly juts out beyond said opening to provide at least for a lower part of said roof arrangement, an area which is greater in plan than the area of said opening.

Particularly in the case of vehicles intended to provide the facility of overnight accommodation, such an elevating roof also creates space in which one or more folding berths can be accommodated. However, prior to the arrangement of Patent Specification 1485975, a disadvantage with known forms of

elevating roof is that the area over which the roof is elevated is restricted by the width of vehicle on which the roof is mounted and, in length, by the length of the roof opening due to the need for the user to reach support arms for the roof, whereby the roof can be manually secured in its raised condition and released therefrom. This restriction in both width and length limits the amount of headroom and area for accommodating sleeping berths particularly in the case where the base vehicle is of relatively small dimensions.

The collapsable canopy arrangement of Patent Specification 1485975 eliminated this disadvantage. In Addition Patent Specification No. 1565322, the canopy arrangement is improved by the use of modified framework means, by which the canopy opens out to provide an elevated roof space which is even wider (i.e. in transverse dimensions) than that of Patent Specification No. 1485975.

However, a disadvantage with the particular embodiments described in said Patent Specifications is that the constructions are such that the elevating roof components have to be fitted progressively onto the vehicles concerned, which is thus labour intensive.

An object of the present invention is to provide a construction for the elevating arrangements claimed in said Patent Specifications Nos. 1485975 and 1565322 which enables the elevating roof components to be pre-assembled, so that the roof arrangement can be readily located and fixed as a unit over a suitably dimensioned cut-out in the roof of the vehicle it is to be fitted to.

According to the present invention, there is provided for use in conjunction with a vehicle having a roof in which is provided a substantially rectangular opening having a pair of longitudinal edges and a pair of transverse edges, an elevating roof unit comprising a rigid substantially rectangular member which is adapted to be hinged along one edge thereof to one longitudinal member of a rectangular base frame for movement between a lowered position covering the opening defined by said base frame and a raised position where it provides one wall of said roof unit, a canopy of foldable material to extend between respective edges of said rigid member and the other longitudinal member and transverse members of said base frame, which canopy is unfolded by movement of said rigid member to its raised position to provide the other walls of said roof, the base frame being adapted to be mounted and fixed over said rectangular opening in said vehicle roof so as to provide an integral elevated roof arrangement for said vehicle.

Preferably, the elevating roof arrangement is basically as claimed in Patent Specification No. 1485975 or No 1565322 and includes framework means which can be moved transversely outwardly to support that wall portion of the canopy opposite to the rigid member such that a region of said canopy providing said wall portion overhangingly juts out beyond the base frame opening to provide, at least for a lower part of said elevating roof unit, an area which is appreciably greater in transverse dimension than said opening.

In order that the invention may be readily understood and further features made apparent, one embodiment thereof, as applied to a pre-assembled elevating roof unit for fixing to a motor caravan, will now be described with reference to the accompanying drawings in which:-

Figure 1 is an external end view of the roof unit in its raised condition and fixed to the motor caravan,

Figure 2 is a plan view of a base frame for the roof unit, and

Figure 3 is an enlarged cross-sectional detail of Figure 1.

Referring to Figures 1 and 2 the roof 1 of the motor caravan is fitted with a pre-assembled elevating roof unit 2 which, when raised, covers and is significantly larger than the rectangular roof opening previously cut into the roof 1, which opening has a pair of longitudinal edges and a pair of transverse edges which are faced with elongated facing strips 3a and 3b respectively (see Figure 3) as discussed hereinafter.

The elevating roof unit 2 includes a rigid roof member 4 and a canopy 5 of suitable waterproof foldable material, for example, PLASTOLENE (Registered Trade Mark). In the closed condition of the roof unit the roof member 4 extends over the entire area of the vehicle roof 1, said member having a peripheral wall 4a, the lower edge of which is covered by a rubber sealing strip 6 and is dimensioned to sit around the periphery of the vehicle roof 1 adjacent its gutter 7. In this closed condition the roof member can be releasably fixed by suitable fastenings, e.g. as described in Patent Specification No. 1565322. As shown in Figure 3, instead of being hinged to the roof 1, as is the case of the embodiments described in said Patent Specifications Nos. 1485975 and 1565322, one longitudinal lower edge of the roof member 4 is hinged, via hinges 10, to a base frame 9, which in turn is located over the rectangular opening in the roof and fixed thereto. Respective edges of the canopy 5 are also attached to the base frame 11 instead of the vehicle roof 1.

Referring to Figure 2 of the drawings, the base frame 9 comprises two spaced longitudinal frame members 11 and 12, one of which has an appropriate number of projecting bracket plates 13 (in this embodiment four) to which each hinge 10 is connected. The members 11, 12 are connected at their respective ends by transverse members 14, 15 of which member 15 is intended to be fitted adjacent the rear end of the vehicle roof 1. A further, intermediate, transverse member 16 extends between members 11, 12 and the rectangular space within the members 11, 12, 15 and 16 is dimensioned to correspond with the rectangular opening in the vehicle roof 1, said frame members providing supports onto which the elongated facing strips 3a and 3b are attached as described hereinafter.

Referring to Figure 3, the longitudinal frame members 11, 12 are of similar construction and comprise an "L"-shaped member 17, the foot 18 of which projects outwardly and sits directly on the vehicle roof 1 and is riveted thereto as shown. An inverted "U"-shaped member 19 is riveted via one of its limbs to the outer face of the upright 20 of the "L"

member as shown. The free edge of the other limb of the member 19 is fitted with a rubber (or similar flexible material) sealing strip 21, which strip extends in a continuous manner along the length of the members 11, 12 as well as the length of the members 14 and 15.

It will be seen from Figure 3 that the transverse member 16 is of "L" shape but curved to follow the line of the vehicle roof 1. The transverse members 14, 15 are also curved to follow the line of the vehicle roof 1 but are of a construction somewhat similar to that of the members 11, 12. A straight "U"-shaped member 22 is supported above the level of the member 16 by brackets 23 and has holes 24 spaced therealong by which a transverse facing strip 3b can be fixed; a similar member and facing arrangement is provided above the level of the member 15. For the facing strips 3a, these can be conveniently pop riveted, via spaced holes, directly onto the uprights 20 of the members 11, 12.

With the construction described above, it will be appreciated that the main elevating roof components as described in Patent Specifications Nos. 1485975 and 1565322 can be fitted using mass-production techniques in a factory directly onto the base frame 11 instead of the vehicle roof 1, and hence a range of different sized, pre-assembled elevating roof units, each incorporating a base frame, can be produced and packaged and/or transported to fitting stations. At the fitting station all that is necessary is to select an appropriate size roof unit for the vehicle to be fitted, cut out the rectangular opening in the vehicle roof, locate and fix the roof unit over the opening, fix the facing strips 3a, 3b in position, and (if provided) trim the vehicle headlining to suit.

The elevating roof arrangement described in the above embodiment, is intended to be basically the same as that described in Patent Specification No. 1565322, and hence the framework means for raising and lowering the roof would be substantially as described in said Specification. Also, telescopic gas arms or similar such as described in said Specification would be provided for assisting the raising of the roof member 4, but said arms would again be connected at their lower ends to the base frame rather than the vehicle roof 1. The berth arrangement within the roof may also be substantially as described in said Specification, or may be of any other suitable form, for example, as described in Patent Application No. 7904736 (laid-open Serial No. 2041837A) which has also been assigned to us.

## CLAIMS

1. An elevating roof unit for use in conjunction with a vehicle having a roof in which is provided a substantially rectangular opening having a pair of longitudinal edges and a pair of transverse edges, said unit comprising a rigid substantially rectangular roof member which is adapted to be hinged along one edge thereof to one longitudinal member of a rectangular base frame for movement between a lowered position covering an opening defined by said base frame and a raised position where it

provides one wall of said roof unit, a canopy of foldable material to extend between respective edges of said rigid member and the other longitudinal member and transverse members of said base frame, which canopy is unfolded by movement of said rigid member to its raised position to provide the other walls of said roof, the base frame being adapted to be mounted and fixed on said vehicle roof over the rectangular opening of said roof so as to provide an integral elevated roof arrangement for said vehicle.

2. An elevating roof unit as claimed in Claim 1, including framework means adapted to be moved transversely outwardly to support that wall portion of the canopy opposite to the rigid member such that a region of said canopy providing said wall portion overhangingly juts out beyond the opening in said base frame to provide, at least for a lower part of said elevating roof unit, an area which is appreciably greater in transverse dimension than said opening.

3. An elevating roof unit according to Claim 1 or Claim 2, wherein the rectangular base frame comprises two spaced longitudinal frame members and at least two transverse frame members which are curved to follow the transverse contour of the roof of the subject vehicle to which the unit is to be applied.

4. An elevating roof unit according to Claim 3, wherein each frame member is of "L"-shape the foot of which projects outwardly and is adapted to sit on the subject vehicle roof and rivetted thereto.

5. An elevating roof unit according to Claim 3 or 4, wherein the rectangular base frame includes an intermediate transverse frame member, and the opening defined between this member and one of the two other transverse members is dimensioned to correspond with the dimensions of the rectangular opening in the subject vehicle roof.

6. An elevating roof unit according to any one of Claims 3 to 5, wherein each frame member defining said base frame opening has a facing strip mounted thereon, which facing strips define a surround for the elevating roof opening as fitted to the subject vehicle.

7. An elevating roof unit according to any one of the preceding Claims, wherein that longitudinal member to which the rigid roof member is hinged is provided with a projecting bracket plate for each hinge, each said bracket plate being curved to follow the contour of the roof and locate in a longitudinal gutter of the subject vehicle roof when fitted, whereby the hinge axes are located in the vicinity of said gutter.

8. An elevating roof unit substantially as hereinbefore described with reference to and as shown in the accompanying drawings.